MODELING FOR INTEGRATED SCIENCE MANAGEMENT AND RESILIENT SYSTEMS DEVELOPMENT

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Many physiological, environmental, and operational risks exist for crewmembers during spaceflight. An understanding of these risks from an integrated perspective is required to provide effective and efficient mitigations during future exploration missions that typically have stringent limitations on resources available, such as mass, power, and crew time. The Human Research Program (HRP) is in the early stages of developing collaborative modeling approaches for the purposes of managing its science portfolio in an integrated manner to support cross-disciplinary risk mitigation strategies and to enable resilient human and engineered systems in the spaceflight environment. In this talk, we will share ideas being explored from fields such as network science, complexity theory, and system-of-systems modeling. Initial work on tools to support these explorations will be discussed briefly, along with ideas for future efforts.